

### 3.14 Basic Trig. Equations

Name \_\_\_\_\_ Date \_\_\_\_\_ Period \_\_\_\_\_

**Find all real numbers in terms of  $\pi$  that satisfy each equation.**

1.  $\cos x = 0$

2.  $\sin(x) + 2 = 0$

3.  $\sin(x) = -1$

4.  $\tan(x) = -1$

5.  $\cos(x) = \frac{1}{2}$

6.  $\sin(x) = \frac{\sqrt{2}}{2}$

7.  $\tan(x) = \frac{1}{\sqrt{3}}$

8.  $\cos(x) = \frac{-\sqrt{3}}{2}$

9.  $2\sin(x) + \sqrt{2} = 0$

10.  $\tan(x) + \sqrt{3} = 0$

**Find all angles in degrees that satisfy each equation.**

11.  $2\cos(\alpha) - \sqrt{2} = 0$

12.  $\tan(\alpha) - 1 = 0$

13.  $\tan(\alpha) = -1$

14.  $\sin(\alpha) = -1$

Find all angles in the interval  $[0^\circ, 360^\circ]$  that satisfy each equation. Round approximations to the nearest tenth of a degree.

15.  $\cos(\alpha) = 0.873$

16.  $\sin(\alpha) = -0.244$

17.  $\tan(\alpha) = 5.42$

Find all angles in the interval  $[0, 2\pi]$  that satisfy each equation. Round to the nearest hundredth.

18.  $\cos(\alpha) = 0.66$

19.  $\sqrt{6} \tan(\alpha) - 1 = 0$

20.  $7 \sin(\alpha) - \sqrt{7} = 0$

Solve each equation.

21.  $\frac{\sin \alpha}{23.4} = \frac{\sin 67.2^\circ}{25.9}$  for  $0^\circ < \alpha < 90^\circ$

22.  $(3.6)^2 = (5.4)^2 + (8.2)^2 - 2(5.4)(8.2)\cos \alpha$  for  $0^\circ < \alpha < 90^\circ$

23. Solve  $t = -6 \sin(m) + 2$  for  $m$  where  $\frac{-\pi}{2} \leq m \leq \frac{\pi}{2}$

Find all real numbers that satisfy each equation. Round approximate answers to 2 decimal places.

24.  $\frac{\sin 33.2^\circ}{a} = \frac{\sin 45.6^\circ}{13.7}$

25.  $3 = 5 \sin(x) + 1$

**Find the exact value of each expression without using a calculator or table.**

26. a)  $\arcsin\left(\frac{1}{2}\right)$

b)  $\cos^{-1}\left(\frac{-1}{2}\right)$

c)  $\tan^{-1}(-1)$

d)  $\sin\left(\frac{\pi}{3}\right)$

e)  $\cos\left(\frac{-\pi}{2}\right)$

f)  $\sin^{-1}(-1)$

27. Simplify:  $\cos(2y)\cos(y) - \sin(2y)\sin(y)$

28. A sector of a circle has a central angle of  $\frac{\pi}{6}$ . Find the exact area of the sector if the radius of the circle is 6 inches.